Nutrient Science Advisors--June 26, 2007
240 Bessey Hall

1- 10:00-12:00 Develop consensus on variables identified June 13:
        -- Define the effects on Class A use(s) and justify a protective threshold
        -- Identify the relationship with N and P

A. Secchi disk depth
    Proposed thresholds are .7 and 1 m or a tier of values—minimum and higher expectations
    1 m -- waist depth, safety, diving accidents, drowning victims
            -- use of Carlson's index — **Muhammed Iqbal**
            -- human health relationships — **Tom Wilton & Ed Bottei**
    0.7-- used by Minn. in southern lakes and Iowa's perception of quality water — **John Olson**
    Relate Secchi depth to Chl-a — **John Downing**

B. Chlorophyll concentrations
    Proposed thresholds include:
    -- concentration associated with visible algal bloom frequency — **John Downing**
    -- possible swimming standards— **John Olson**
    Nuisance threshold – use a probability of exceeding that threshold — **John Downing &
    John Olson**

C. Cyanobacteria
    Proposed thresholds include:
    -- Cyanotoxins (Microcystins) < 1 μg/L
    -- WHO standard — **John Olson**
    (biomass? faction of phytoplankton biomass?)
    -- Cyanobacteria—15,000 cells per ml from Am Water Works Association – **Chris Jones**
    -- General consensus was that dominance (>50% of total phytoplankton biomass) is good
    place to start a criterion.

D. Phytoplankton (biomass?)
    Relate to chlorophyll—use criteria for both or select one that relates best to N and P

E. Nitrogen (total?)
Develop relationship with all other variables

F. Total Phosphorus
    Develop relationship with all other variables

Other possible variables
Macrophytes – snails/swimmer's itch – **Joe Larsheid**
Bacteria – **Pete Weyer and Chris Jones**
Smell—hypoxia— what are the odor signals – Mike **Quist and Chris Jones**
Bottom texture related to size—smaller= muddier

Surface scum

12:00 Catered Lunch

2- 12:00-1:00 – Document relationships between each critical variable and N and P
We will need volunteers to search literature and data to define relationships with indirect variables agreed to above.
General Relationships
Relationships measured in Iowa

3- 1:00-2:30 – Quantify concentration, frequency, and duration of N & P that impair each use
It was proposed that we use a probability approach to combine the three elements of numerical criteria (concentration, duration, and frequency). This would require three steps
1- Determine threshold above/below which the use would not be protected (agenda item 1)
2- Determine the relationship to N and/or P (agenda item 2)
3- Use cumulative frequency curves to define the probability of meeting and exceeding the threshold
John Downing –discuss specifics
Volunteers from 2 to work on this aspect as well

4- 2:30-3:30 – The aquatic life designated use (3 B(LW))
Suggestions included:
A. Sudivide the class and set criteria for each subdivision (Consensus was NOT to subdivide on morphometry)
B. Establish a template or tiered classification:
-- historical conditions – pre-Columbian conditions; pre- 1971 (CWA); current conditions. What historical analyses are available from Okoboji and other lakes? – **Mike Birmingham**
-- aquatic life – a system being examined by EPA – **Gary Welker and Ann Jacobs**
-- Index of Biological Integrity (IBI) – multi-metric index related to ecological condition and structure- 0 (poor) 100 (excellent). Consensus was that reference conditions in lakes similar to those in Iowa could not be found.

C. Definition of "Lake"—includes wave action – **John Downing**
E. How do we deal with impoundment lakes to define and characterize their aquatic life?
F. Good to bad lakes can be determined using a nutrient spectrum related to zooplankton, benthos, fish-small fish, perhaps others. – **John Downing and Mike Quist**
G. GW and AJ investigate what other states doing with aquatic life standards.

5- 3:30-4:00 – Wrap up of assignments
Use of Forum
Future meetings